Pulsed Linac at 45 mA / TRACKv39 Vs ASTRA

Parameters at the end of 325 MHz section

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TRACKv39 / ASTRA simulations

- ▶ Simulations performed for the FNAL Pulsed Proton Driver at 45mA
- ▶ Simulations from RFQ exit to end of the 325 MHz section (∼138 meters)
- ▶ Each error simulated with 400 runs and 3D SC on FermiGrid
- ▶ Cavity Phase and Field Jitter + Sol. Field Jitter + Quad Field Jitter = Gaussian distribution truncated at +/-3 sigma
- ▶ All other errors = Uniform distribution
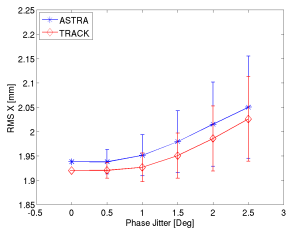
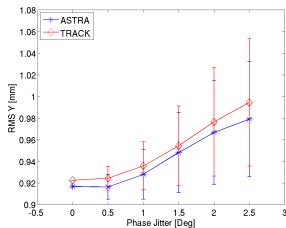# Cavities δ_ϕ

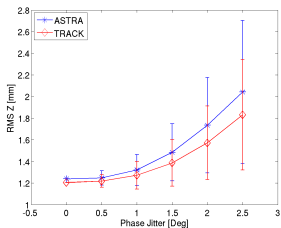Figure: RMS Size X

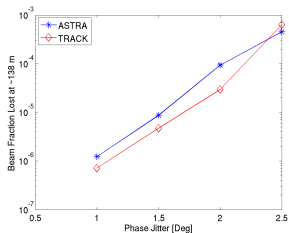Figure: RMS Size Y

Figure: RMS Size Z

Figure: Beam Fraction Losses

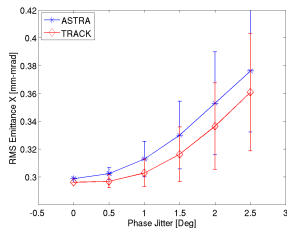# Cavities δ_ϕ
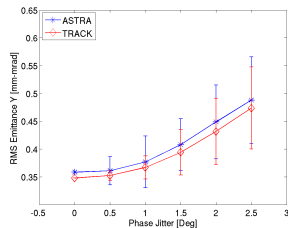
Figure: RMS Emittance X
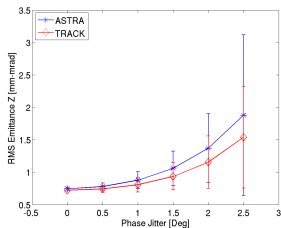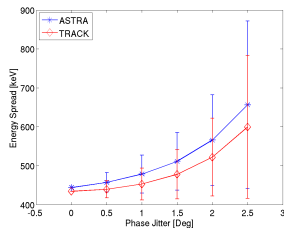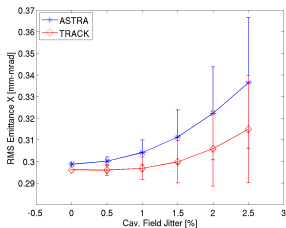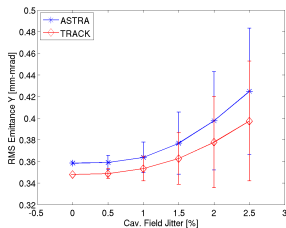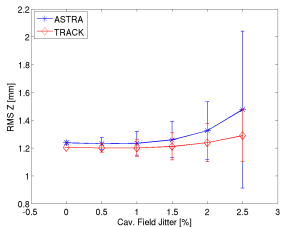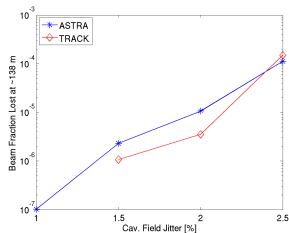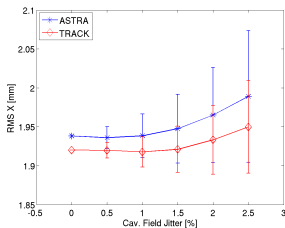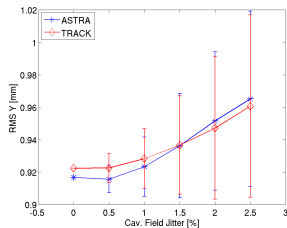

Figure: RMS Emittance Y

Figure: RMS Emittance Z

Figure: RMS Energy Spread

Cavities δ E

Figure: RMS Size X

Figure: RMS Size Y

Figure: RMS Size Z

Figure: Beam Fraction Losses

Cavities δ E

Figure: RMS Emittance X

Figure: RMS Emittance Y
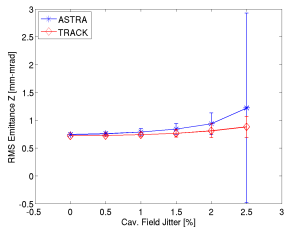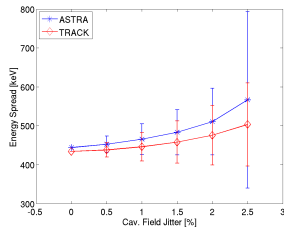

Figure: RMS Emittance Z

Figure: RMS Energy Spread

Quad Field δ F

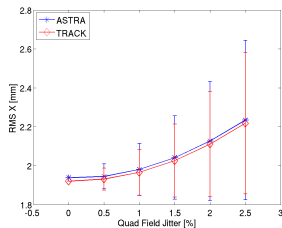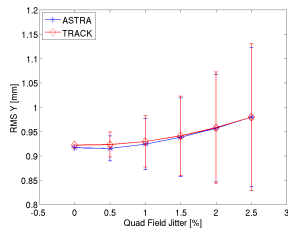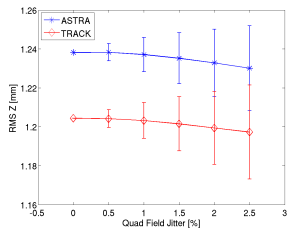Figure: RMS Size X

Figure: RMS Size Y

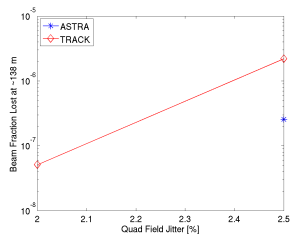Figure: RMS Size Z

Figure: Beam Fraction Losses

Quad Field δ F
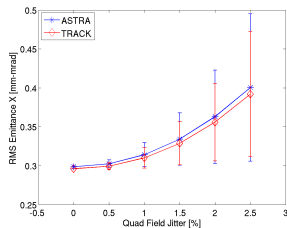
Figure: RMS Emittance X

Figure: RMS Emittance Y
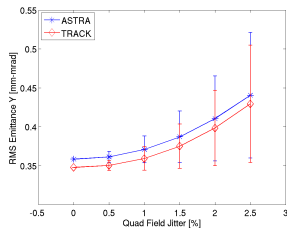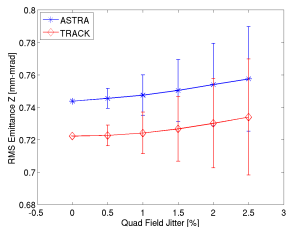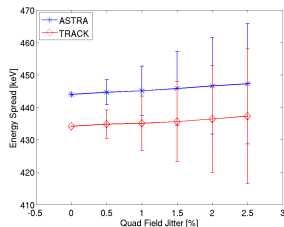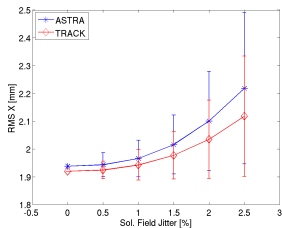

Figure: RMS Emittance Z

Figure: RMS Energy Spread

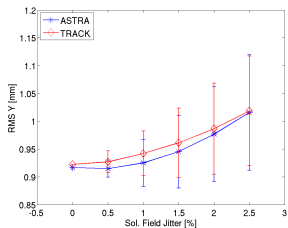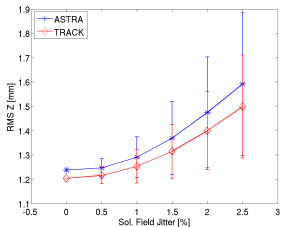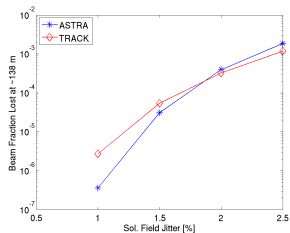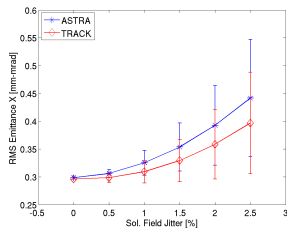# Sol. Field δ F

Figure: RMS Size X

Figure: RMS Size Y

Figure: RMS Size Z

Figure: Beam Fraction Losses

Sol. Field δ F

Figure: RMS Emittance X
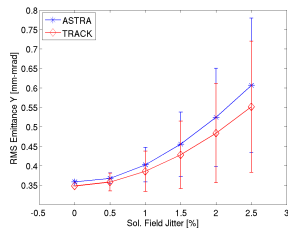

Figure: RMS Emittance Y

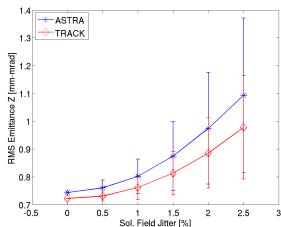### Figure: RMS Emittance Z

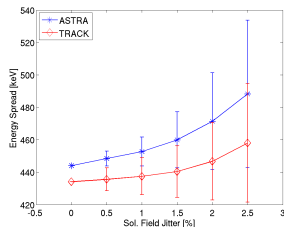### Figure: RMS Energy Spread

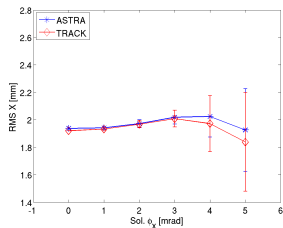# Sol. $\delta\phi_x$
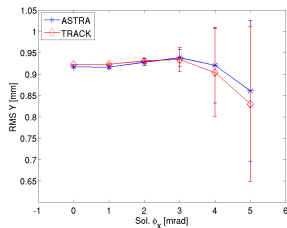
Figure: RMS Size X
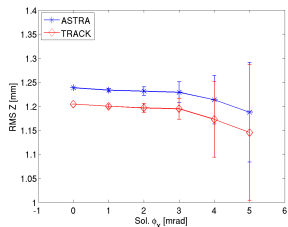

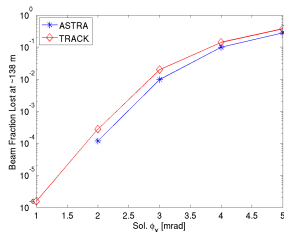Figure: RMS Size Y

Figure: RMS Size Z

Figure: Beam Fraction Losses

Sol. $\delta\phi_x$

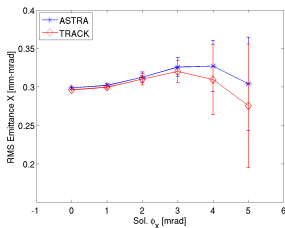Figure: RMS Emittance X

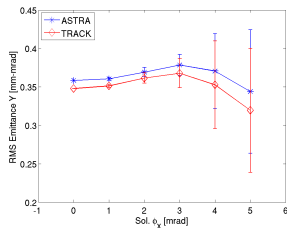Figure: RMS Emittance Y

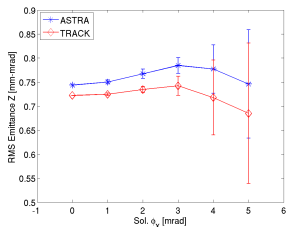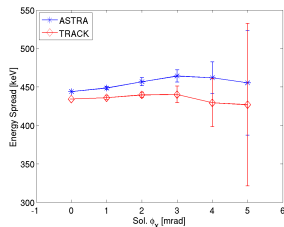Figure: RMS Emittance Z

Figure: RMS Energy Spread

Sol. δ_x
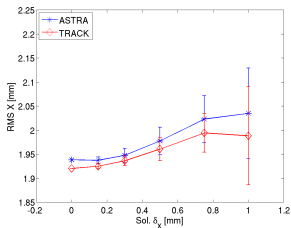
Figure: RMS Size X

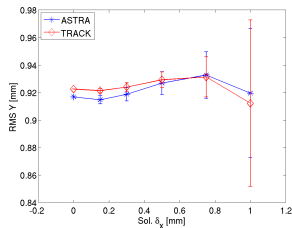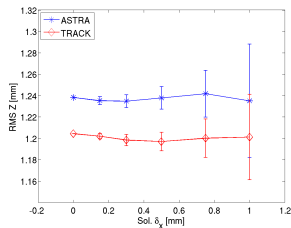
Figure: RMS Size Y
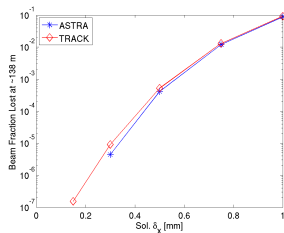

Figure: RMS Size Z

Figure: Beam Fraction Losses
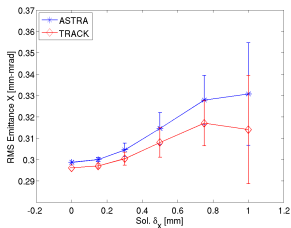
Sol. δ_x

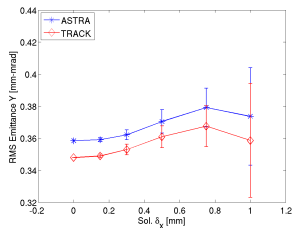Figure: RMS Emittance X

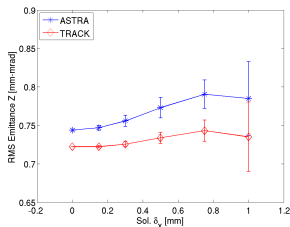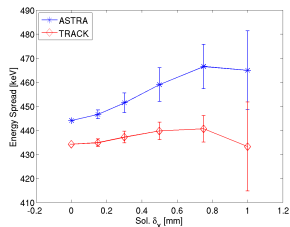Figure: RMS Emittance Y

Figure: RMS Emittance Z

Figure: RMS Energy Spread
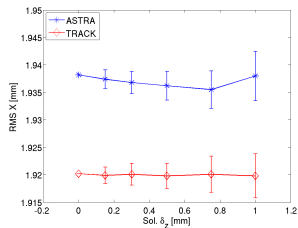
Sol. δ_z

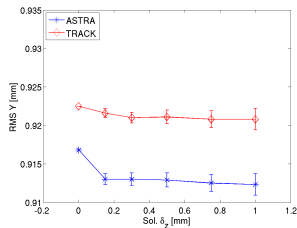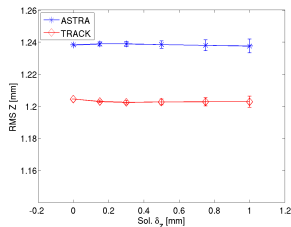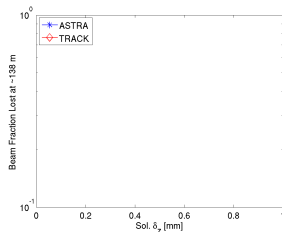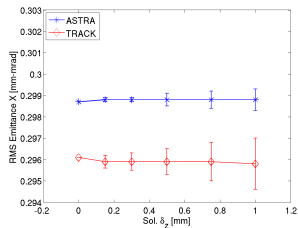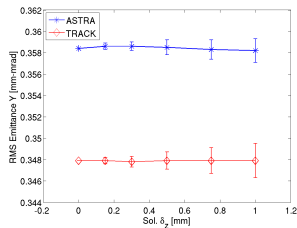Figure: RMS Size X

Figure: RMS Size Y

Figure: RMS Size Z

Figure: Beam Fraction Losses

Sol. δ_z

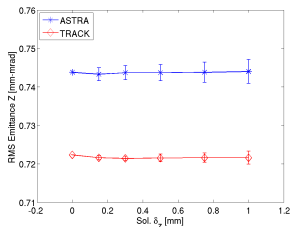### Figure: RMS Emittance X

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